

**Commonwealth of Kentucky
Division for Air Quality**

REVISED PERMIT STATEMENT OF BASIS

Revised after comments
Title V draft permit, No. V-06-038

**Duke Energy Kentucky
East Bend Station**

Union, Kentucky 41091

May 25, 2007

Herbert Campbell, Reviewer

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|-----------------|--------------|
| Source I.D. # | 21-015-00029 |
| Source A.I. # | 176 |
| Activity I.D. # | APE20040006 |

SOURCE DESCRIPTION:

An application for a renewal of the Title V Permit, V-97-015R2, for the Duke Energy Kentucky /East Bend Generating Station was received on June 22, 2004. A nitrogen oxides (NO_x) budget permit application was received on June 16, 2003. The new Title V permit will include a renewal of the Phase II Acid Rain Permit and the NO_x Budget Permit.

The source is an electric power generating station consisting of one (1) pulverized coal-fired boiler. The boiler (E. Unit 02) has an input capacity of 6313 MMBtu/hr. The unit is wall-fired, equipped with an electrostatic precipitator (ESP), flue gas desulfurization (FGD) unit, low nitrogen oxide burners and an Selective Catalytic Reduction (SCR) unit. In addition, ash, coal and limestone related equipment as well as a synfuel operation for the binding of coal fines to form coal pellets is utilized.

The facility is classified as a Title V major source of air pollution based on the potential to emit more than 100 tons per year (tpy) of particulate matter less than 10 microns (PM₁₀), carbon monoxide (CO), nitrogen oxides (NO_x), and sulfur dioxide (SO₂).

The processes that are new or different from the most recent source-wide Title V renewal permit application include:

1. Installation of the Selective Catalytic Reduction (SCR) unit for reduction of nitrogen oxides from E. Unit 2.
2. A Synfuel Production facility (E. Unit 15) has been added at the facility.
3. Metal Cleaning Degreasers (E. Unit 7) have been removed as stated in the letter of notification dated November 3, 2000.

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The following is a list of significant emission units, control equipment and construction date.

- E. Unit 02: Pulverized coal-fired, dry bottom, wall-fired unit equipped with an electrostatic precipitator, flue gas desulfurization (FGD), low nitrogen oxides burners, and Selective Catalytic Reduction (SCR); construction commenced 1976. Secondary fuel is petroleum coke.
- E. Unit 03: Coal handling operations includes barge unloader, stockpile, conveyor E, and carry all bin including load-in and load-out, which diverts coal from the crusher to the open stockpile; stockpile includes use of watering and compaction; construction commenced 1976.
- E. Unit 04: Coal crushing and processing operations include conveyors A, B, C, D, F-1, G-1 and transfer points, primary crushers, coal bunker, coal pile load-in, coal pile reclaim; two crushers equipped with enclosure and baghouse, conveyors and transfer points equipped with enclosure and baghouse, coal bunker load-in equipped with baghouses, and coal pile reclaim equipped with baghouses; construction commenced 1976.
- E. Unit 09: Main flyash storage silo loadout to dump trucks, construction commenced 1976.
- E. Unit 10: Flue gas desulfurization sludge fixing plant equipped with enclosures for conveyors and transfer points, enclosure and two hydrostatic rotoclones (wet type dust collectors) for the two pug mills, construction commenced 1976.
- E. Unit 11: Plant roadways, construction commenced in 1976.
- E. Unit 12: Landfill operation includes landfill equipped with watering for control, construction commenced in 1976.
- E. Unit 13: Emergency diesel generator, construction commenced in 1976.
- E. Unit 14: Lime handling operations equipped with lime barge unloader, unloader hopper, truck dump operations for main lime silo, main lime silo truck loading, and truck dump to lime fixing plant lime hopper; construction commenced 1976 for this unit; control measures and devices include enclosure, partial enclosure, and baghouses.
- E. Unit 15: Synfuel operations include equipment for coal fines receiving, transfer and storage operations, equipment for transfer of coal fines from storage to mixing unit with liquid binder to form pellets and equipment for transfer of pellets to storage or to plant for fuel.

The following regulations are applicable to the units:

EU 02: Coal-Fired Indirect Heat Exchanger, 6313 MMBtu/hr

The EU 02 unit is a Babcock & Wilcox Corporation coal-fired boiler and was installed after 1976. The unit has a rated fuel input capacity of 6313 million British thermal units per hour (MMBtu/hr). The primary fuel burned for the unit is coal, and the secondary fuel is pet coke.

401 KAR 50:012 General application

401 KAR 52:060 Acid rain permits;

401 KAR 51:160 NO_x requirements for large utility and industrial boilers;

401 KAR 59:015 New indirect heat exchangers applicable to an emission unit with a capacity of more than 250 MMBtu per hour and commenced on or after August 17, 1971.

401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart D, Standards of Performance for Performance for Fossil-Fuel-Fired Steam Generators for which construction is commenced after August 17, 1971.

401 KAR 51:017 Prevention of significant deterioration of air quality

40 CFR 64 Compliance Assurance Monitoring (SO₂, NO_x & PM/Opacity)

EU 02 has 18315 Phase II allowance allocations set by 40 CFR 73.

401 KAR 52:060, Acid rain permits, applies to EU 02, for the prevention, abatement, and control of air pollution and incorporates by reference the federal acid rain provisions as codified in 40 CFR Parts 72 to 78. The NO_x limit and the averaging plans are set by 40 CFR 75 and 76. The units do have SO₂ allowances as listed in 40 CFR, 73.10 for each year from 2000 to year 2009.

401 KAR 51:160, NO_x requirements for large utility and industrial boilers, and 40 CFR 97, Subpart C, applies to EU 02. The NO_x Budget Permit application for these units was submitted to the Division, and received on June 16, 2003. Requirements contained in that application were incorporated into and made part of the NO_x Budget Permit. Pursuant to 401 KAR 52:020, Section 3, the source shall operate in compliance with those requirements.

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Pursuant to 401 KAR 59:015, Section 4(1)(b), and 401 KAR 51:017, particulate emissions shall not exceed 0.10 lb/MMBtu based on a three-hour average for EU 02. The permittee may assure continuing compliance with the particulate emission standard by operating the affected facility and associated control equipment such that the opacity does not exceed the upper limit of the indicator range developed from COM data collected during stack tests. If five (5) percent of COM data (based on a three-hour rolling average) recorded in a calendar quarter show excursions from the indicator range, the permittee shall contact the Division within thirty (30) days after the end of the quarter to schedule a stack test to demonstrate compliance with the particulate standard while operating at the conditions which resulted in the excursions. The Division may waive this testing requirement upon a demonstration that the cause of the excursions has been corrected, or may require stack tests at any time pursuant to 401 KAR 50:045, Performance tests.

Pursuant to 401 KAR 59:015, Section 4(2), emissions shall not exceed twenty (20) percent opacity based on a six-minute average except a maximum of twenty-seven (27) percent for not more than one (1) six (6) minute period in any sixty (60) consecutive minutes for EU 02. Per 40 CFR 64, compliance for the opacity limit may be demonstrated by using continuous emission monitoring (COM).

Pursuant to 401 KAR 59:015, Section 5(1)(b), and 401 KAR 51:017, sulfur dioxide emission shall not exceed 1.2 lbs/MMBtu based on a three hour average for EU 02. Compliance assurance for the sulfur dioxide (SO₂) limit may be demonstrated by using continuous emissions monitors (CEMS).

Pursuant to 40 CFR Part 76, nitrogen oxides emission shall not exceed 0.50 lb/MMBtu based on a thirty (30) calendar day continuous rolling average for EU 02. Compliance assurance for the nitrogen oxides (NO_x) limit may be demonstrated by using continuous emissions monitors (CEMS).

The use of the continuous emissions monitors (CEMS) will ensure compliance with the nitrogen oxides (NO_x) CAM requirements.

EPA Reference Method 9 shall be performed whenever EPA Reference Method 5 testing is performed. All results shall be documented. In addition, COM data shall also be documented during the same testing time interval. Thus, the permittee may assure compliance with the opacity standards for this emissions unit using data collected by COM in lieu of Reference Method 9.

EPA Reference Method 5 or equivalent shall be performed within 1 year from issue of this permit to determine the amount of PM emissions per ton of coal processed. The heating value of coal used during the test shall be specifically tested and documented. The opacity shall be recorded from the COM and from Reference Method 9 readings during the stack tests and reported with the test results. The amount of coal combusted (tons), the heating value of coal from a coal analysis (MMBtu/ton), and the calculated emission factor (lbs of PM/MMBtu) shall be documented and reported with the test results. If no additional stack tests are performed, excluded the test performed within 1 year from issue of this permit, the permittee shall conduct one performance test for particulate emissions by the start of the fourth year of this permit to demonstrate compliance with the allowable standard.

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EU 03: Coal Handling Operations

EU 09: Main Flyash Storage Silo Loadout to Dump Trucks

EU 11: Plant Roadways

EU 12: Landfill Operations

EU 14: Lime Handling Operations

EU 15: Synfuel Operations

The following regulations are applicable to the units:

401 KAR 63:010, Fugitive emissions is applicable to each affected facility which emits or may emit fugitive emissions and is not elsewhere subject to an opacity standard within the administrative regulations of the Division for Air Quality;

Pursuant to 401 KAR 63:010 Section 3, no person shall cause or permit the discharge of visible fugitive dust emissions beyond the lot line of the property on which the emissions originate. In addition, reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including the materials processed at each unit listed above shall be controlled with wet suppression and/or enclosures so as to comply with the standards specified in Section 3 of 401 KAR 63:010, Fugitive emissions. Compliance is demonstrated when daily observations indicate no visible fugitive dust emissions extend beyond the property line and that the processes and controls are operating normally. Observations and records, if applicable, shall be utilized to document failure to comply.

The permittee shall monitor the amount of coal, and lime received and processed, and flyash and sludge processed through each piece of conveying or handling equipment, including stockpiles, on a weekly basis. Visible emissions from each piece of equipment or operation described for this item or group shall be monitored daily during daylight hours to determine whether conditions appear to be normal or abnormal. If the emissions appear to be abnormal, the permittee must then comply with the deviation reporting. The permittee shall maintain records of the amount of coal received and processed through each piece of conveying or handling equipment, including stockpiles, on a weekly basis.

EU 04: Coal Crushing and Processing

The following regulations are applicable to the units:

401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Y, Standards of Performance for Coal Preparation Plants. Applicable to conveyors and crushers, which process more than 200 tons of coal per day and commenced after October 24, 1974.

401 KAR 51:017, Prevention of significant deterioration of air quality

EU 15: Synfuel Operations

401 KAR 63:010, Fugitive emissions is applicable to each affected facility which emits or may emit fugitive emissions and is not elsewhere subject to an opacity standard within the administrative regulations of the Division for Air Quality;

40 CFR 60, Subpart Kb -- Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 (60.110b--60.117b)

Regulations not applicable to Cooling towers due to applicability date.

401 KAR 63:002, incorporating by reference 40 CFR 63, Subpart Q, National emission standards for hazardous air pollutants for industrial process cooling towers.

EU 7: Degreasers have been removed.

EU 10: Flue gas desulfurization

401 KAR 59:010, New process operations, applicable to an emissions unit commenced on or after July 2, 1975.

EU 13: Emergency diesel generator is not subject to any applicable requirements, and is an engine, not a heat exchanger

OPERATIONAL FLEXIBILITY: N/A

EMISSION AND OPERATING CAPS DESCRIPTION: N/A

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.

PAST PERMIT SUMMARY:

| Permit type | Log # | Complete Date | Issuance Date | Summary of Action |
|----------------------------------------------------------------------|-------------------|----------------------|----------------------|------------------------------------------------------------------|
| V-97-015R2 Title V | E954 | | 12/21/1999 | Initial Title V |
| A-98-014 Acid Rain Permit | | | 3/9/1999 | Acid Rain Permit |
| V-06-038 Title V Renewal w/ Acid Rain, NOx Budget | AI 176 | | | Title V Renewal w/ Acid Rain & NOx Budget Permits |